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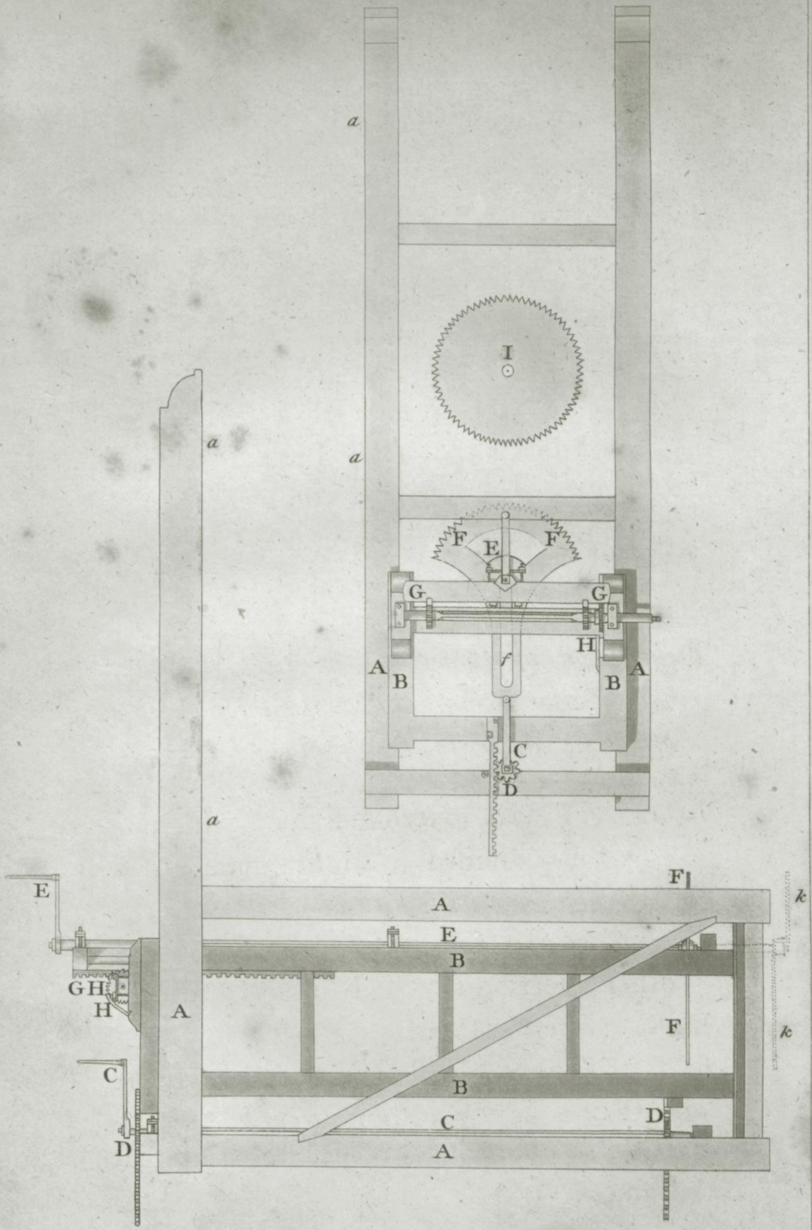
PAPERS

IN

MECHANICKS.



Mr. Fould's Machine for cutting Piles under Water.

MECHANICKS.

The GOLD MEDAL was this Seſſion voted to Mr. JOHN FOULDS, Engineer to the London-Bridge Water-Works, for his ingenious Contrivance of a MACHINE FOR CUTTING OFF PILES UNDER WATER; of which a complete Model and Drawing are reſerved in the Society's Collection, and a Plate is annexed.

Deſcription of the Plate of the Model of Mr. JOHN FOULDS's *Machine for cutting off Piles under Water.*

A. A. THE external frame, which is framed at right angles; and when the frame *a. a.* is laid level, the piles are cut off perfectly ſo, or in any other direction in which it is placed.

B. B. Internal frame.

C. C. Upright ſpindle and handle, which, with the racks and pinions

D. D, advance or recede the internal frame.

E. E. Up-

E. E. Upright ſpindle and handle fixed to the internal frame, by which the ſaw F. F. is worked. In a piece of iron, fixed behind the ſaw, is a mortiſe, *f.* by which the ſaw is admitted to advance upon its centre, as the work goes on; and thus the piles may be cut in any direction required. The ſaw is held faſt or looſened by a ſcrew underneath.

G. G. Vertical racks, worked by an horizontal ſpindle with pinions, by which the internal frame and ſaw is raiſed and lowered, to cut off Piles at various heights.

H. H. A wheel with pall, to ſupport the frame at any determined height.

I. A circular ſaw, to be uſed occaſionally.

Plate 1

Fig. 1.

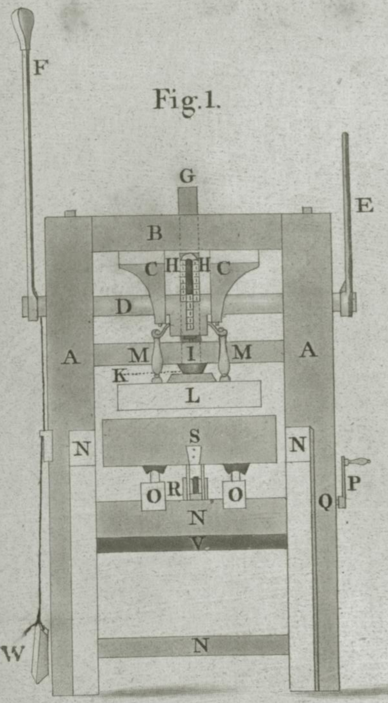


Fig. 2.

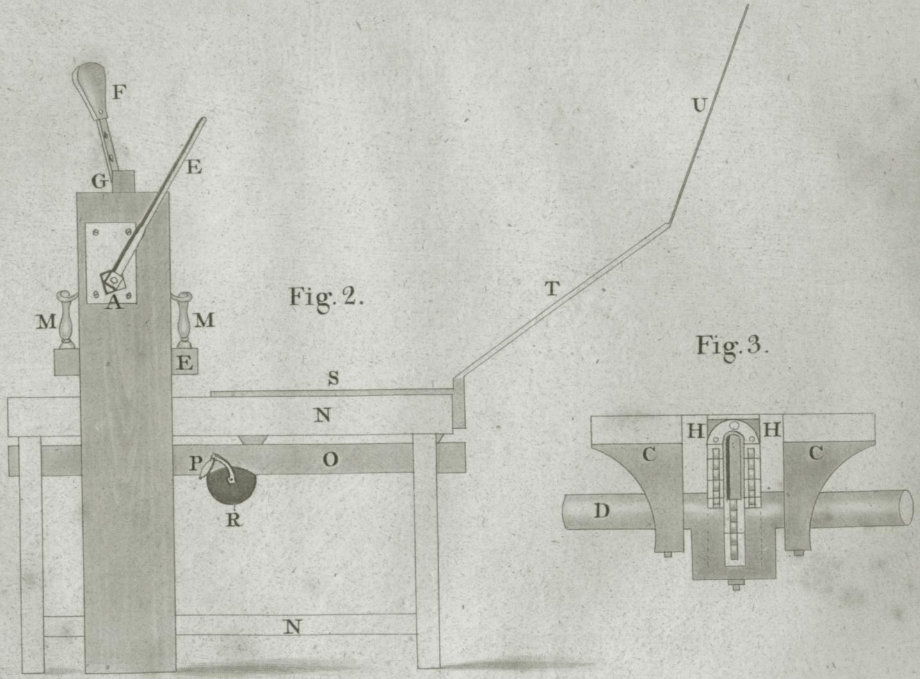


Fig. 3.

Mr. Joseph Ridtey's Printing Preſs

FORTY GUINEAS were this Seſſion voted to Mr. JOSEPH RIDLEY, for his Improvement of the PRINTING-PRESS, as deſcribed in the following Paper, and ſhewn in the Plate annexed; and of which a complete working Model is reſerved in the Society's Repoſitory, for the inſpection and uſe of the Public.

Explanation of Mr. JOSEPH RIDLEY'*s Printing-Preſs, of which a Front and Side View are ſhewn,* Fig. 1 and 2, Plate 4.

THE Head of the Preſs is the chief object of this improvement, from which the ſcrew hitherto in general uſe is taken away, and a perpendicular bar of ſteel, with a conical end, lodged in a cup on the platen, ſubſtituted in its ſtead. The purchaſe is obtained by means of a ſpindle paſſing through each ſide of the Preſs, near the bar, to which it is attached by three chains; the two outer ones ſerving to pull down the bar and platen, and the middle one to raiſe or recover them again. To one end of this ſpindle a lever or handle, about two feet long, is fixed, which, by means of the two chains, pulls down the platen with any force required: at the other end of the ſpindle is alſo another lever, with a weight acting as a fly, which weight may be fixed by means of holes in the lever, at ſuch diſtance from the centre as may be judged neceſſary, according to the work to be done.

Deſcription of the Plate.

A. A. Two ſtrong perpendicular cheeks joined together by three croſs pieces.

B. The upper croſs piece, or head-piece, ſuſtains the preſſure by the two ſtays C.C. being firmly ſcrewed to the head-piece, and having at the ends two ſlit collars to receive the ſpindle D. which is governed by the lever or handle, E. two feet long, and by which the purchaſe is obtained, and may be aſſiſted, if required, by the other lever, F, with a moveable weight on the other ſide of the Preſs: this weight only becomes uſeful when power and diſpatch are the leading objects. A weight of lead, W, hangs by a cord over a pulley fixed on the axis at the bottom of the lever, F, ſerving to aſſiſt the return of the lever when the platen riſes. The ſpindle D is made broader in the middle than at the ends: the ſpindle and the upright bar, G, are connected by three chains, H H, two of which afford the pull, and the other reinſtates the bar and platen: of theſe chains one is bolted by one end to the lower part of the bar, ſo as to admit the other two, one on each ſide, the lengthwiſe of the bar; and the other end of the chain is brought over the middle of the broad part of the ſpindle, and ſcrewed through the bottom, ſo as to afford an opportunity of adjuſting the chain. The two outer chains being, by means of a ſwivel, extended wide enough to admit the centre one between them, a ſtrong bolt muſt paſs through the middle of the ſwivel, and the upper part of the bar; and being ſtayed faſt on the back of the bar by a nut or forelock, the other two ends of the chains muſt be brought under the broad part of the ſpindle, one on each ſide the ſingle chain, and ſcrewed to the bottom, as before mentioned. A notch is made in the middle of the ſpindle, in order to receive the three chains, and thereby obtain a great purchaſe. The upper part of the bar, G, is incloſed, and worked in a collar in the middle of the head-piece B: the middle of the bar paſſes by the ſpindle, to which it is coupled by the aforeſaid chains; and the lower end is conveyed through another collar fixed in the middle of the ſhelf, I: the cone at the lower extremity is lodged in a ſteel cup, K, ſcrewed on the middle of the platen; the platen is ſuſpended by four ſprings, branching out from the bar, above the ſhelf, I, with a hole at each of their ends, in order to receive the tops of the four pillars, M M. on which male ſcrews are cut: the baſes of theſe pillars are fixed on the platen near the four corners. By nuts properly applied to the ſcrews above the ſprings, the workmen are enabled to adjuſt the platen, ſo that it comes down parallel to the ſtone, and form of letters laid thereon. N N N. the body or frame of the Preſs. V. the lower croſs-piece or main brace, which acts againſt the head, between which are the ribs, O O. The coffin, S. and the form of letters; and upon that the paper, tympans, &c. and friſket, T. U.

The ribs, O O, lie acroſs the main brace, V, and extend beyond the two ends of the frame, to which they are ſtrongly ſcrewed: two long bars of iron, faſtened to the ribs, bear on them the coffin, to the bottom of which ſix pieces of hollow iron are firmly fixed, well fitted and ground ſmooth, in order to procure an

eaſy

eaſy traverſe, by a gentle motion of the rounce, P, fixed on the end of the ſpit, Q, on which is put a double pulley, R, with two ſtraps made faſt thereto, each at one end; the other ends of the ſtraps are attached one to each end of the coffin, S, to convey it with accuracy to the deſired place*. In the coffin is placed a poliſhed ſtone, forming a flat ſurface with the verge of the coffin; it has likewiſe joined to it, by means of two hinges, the tympan, T, which, in performing the work of printing, is, as uſual, firſt underlaid with parchment, on that two flannels are laid, over them the upper tympan, with a parchment, as before; then U, a thin frame of iron, the ſize of the tympans, called the friſket, on which is paſted a ſheet of paper, cut out in the form of the pages impoſed, in order to keep the ſheet in printing clean, and in its proper place.

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* No work with this Preſs requires more than one pull.

In order that the ſtays, C C, the ſpindle, D D, and the chains, H H, with part of the bar, may be more diſtinctly ſeen, they are ſhewn on a larger ſcale, at Fig. 3.

THIRTY GUINEAS were this Seſſion voted to Mr. WILLIAM BOWLER for his Invention of a CHURN, as ſhewn in the Plate annexed, No. 5: and the Churn is reſerved in the Society's Repoſitory, for the uſe of the Public.

SIR,

THE bearer, William Bowler, I beg leave to recommend to your notice: he has invented a Churn, which, upon trial, is much ſuperior to any of the Churns that I know are now in uſe. My ſervant has been, for the two laſt times of churning, with the barrel-churn ten or twelve hours: I have known farmers who have been two days before they have got butter; and upon a fair trial, with this new-invented Churn, it produced good butter within the hour.

I am, SIR,

Your moſt obedient ſervant,

Waltham Abbey, JAMES BERWICK.
January 13, 1795.

Mr. MORE.

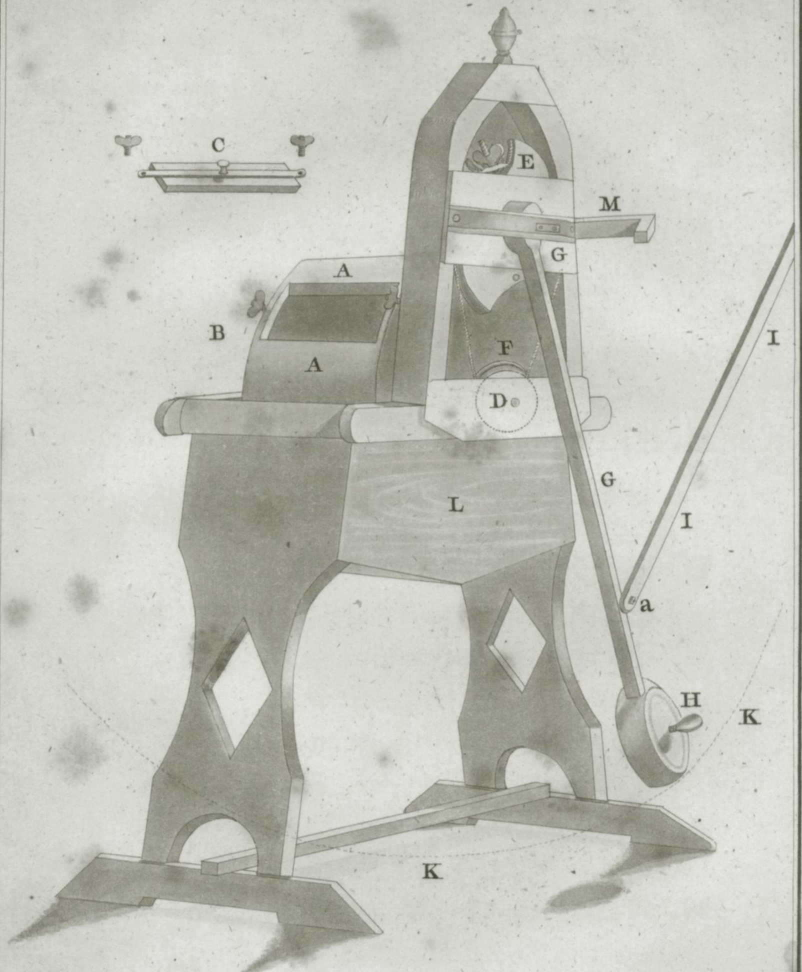
Ex-

Explanation of Mr. WILLIAM BOWLER'*s* *improved Churn.*

THE Churn itſelf is of the barrel-kind, being a cylinder, eighteen inches diameter, and nine inches wide, the ſides wood, and the rim tin-plate, having two openings; the one, eight inches and a half long, by four inches wide, through which the cream is put into the Churn, and the hand introduced for cleaning it; the other, a ſhort pipe, one inch diameter, by which the butter-milk runs out of the Churn when the operation is finiſhed. The firſt of theſe openings has a wooden cover, faſtened down by two ſcrews, and the other a cork fitted to it, while the butter is churning. There is alſo, near the larger opening, a ſmall vent-hole with a peg, to allow a paſſage for any air diſcharged from the cream at the beginning of the operation. An axle paſſes through the Churn, terminating in two gudgeons on which it hangs, its lower part being immerſed in a trough, to occaſionally hold hot or cold water according to the ſeaſon of the year; and on the inſide of the rim are four projecting pieces of wood, with holes in them, ſerving to beat the cream by the motion of the Churn: this motion is cauſed by a pendulum, three feet ſix inches long, having an iron bob, weighing ten pounds, and at its upper end turning a pulley, ten inches diameter, from which goes a rope twice round another pully, about three inches diameter, fixed on the axis of the Churn, and cauſing it to make a partial revolution by each vibration of the pendulum. There are ſliding covers to the machinery, and alſo a cover to the water-trough, in order, when the hot water is uſed, to ſecure the ſteam, and keep the cream in a due and neceſſary degree of warmth. The motion of the pendulum is given and kept up by a wooden rod, about three feet nine inches long, turning on a pin about three inches above the bob of the pendulum.

Deſ-

Plate 5.



M^{r} Will^{m} Bowler's improved Churn.

Deſcription of the Plate of Mr. WILLIAM BOWLER'*s improved* CHURN.

A. A. The body of the Churn.

B. An opening, by which the cream is put in.

C. The cover of the large opening. The ſmall hole on the oppoſite ſide of the Churn cannot be ſhewn in the print.

D. The gudgeon on which the body of the Churn hangs.

E. The upper or larger pulley.

F. The ſmaller pulley fixed on the axis or gudgeon of the Churn.

G. G. The rod of the pendulum hanging from the upper pulley, E.

H. The bob of the pendulum.

I. I. The handle, moveable on a pin at *a*, by which the pendulum is moved to and fro, making a traverſe, in form of the dotted line, K. K.

L. The trough for the hot or cold water.

M. A projecting piece of wood, with a ſhoulder, by which the handle I. is ſupported when the churn is not at work.

A Bounty of TWENTY GUINEAS was this Seſſion voted to Mr. JOSEPH KNEEBONE, for his invention of a DRAG to prevent the Accidents which ſo frequently happen to Horſes drawing loaded Carts down ſteep Hills. Of this Contrivance a Wood-cut and Deſcription are given.

SIR,

FROM the great advantages which the Public have derived from the Society for the Encouragement of Arts, Manufactures, and Commerce, it behoves every individual to contribute towards the further progreſs of thoſe improvements which have in a great meaſure been laid open by the liberal donations of this Society.

Permit me then, Sir, to preſent you a model of a ſimple contrivance, invented for the ſafe and effectual ſtopping of carts, or any two-wheeled carriages, in deſcending ſteep hills, ſo as to take off the great burden from the back of the ſhaft-horſe, and to permit the carriage to deſcend with the greateſt eaſe and ſafety, and which it will do in the moſt mountainous country, with as much eaſe as on a plain. This ſimple and uſeful contrivance, called here a Dog, or Wheel-drag, was invented by Joſeph Kneebone, a poor cordwainer, of this place, who, being obliged for ſome time to undertake the buſineſs of a carter, was frequently diſtreſſed in deſcending ſteep hills; and, after a variety of contrivances, he was at laſt ſo fortunate as to complete the machine here deſcribed, which on every occaſion has never failed to anſwer the deſired purpoſe. I have ſeen it tried, in a variety of inſtances; and within theſe ſix months its uſe has become general, particularly among farmers, where nothing but real and ſtriking advantages can induce them to a change of cuſtom, and which, I preſume, is a mark of its great utility.

This contrivance may be applied to any kind of roads, and is not ſubject to the inconvenience of locking-poles, which on rough roads, or deep ruts, are very apt to overturn carts by the ſudden reſiſtance they meet with.

Should the Society think this invention worthy their attention and patronage, the inventor, who is a poor man, with a large family, will be much obliged for any reward which they may think proper to confer on him: and I ſhall feel myſelf very happy in having an opportunity of preſerving and preſenting to the Public, a contrivance ſo admirably calculated to remove the danger and inconveniency of loaded carts in deſcending ſteep hills.

In order to make the deſcription of this Wheel-drag more intelligible, I have ſent you a model, made of mahogany, and likewiſe an imperfect drawing, with references to its different parts.

I am, SIR,

Your moſt obedient humble ſervant,

RICHARD MOYLE.

Marazion,
Dec. 26. 1794.

Mr. MORE.

THE Society having thought proper (after examining the model above alluded to) to requeſt Mr. Moyle to obtain for them a Drag at large; the following letter was received from that gentleman, in anſwer to one written to him: and a trial having been made of the Drag in London, the Bounty was given to Mr. Joſeph Kneebone, and both the model and Drag are reſerved in the Society's Repoſitory, for the uſe of the Public.

SIR,

ON the receipt of your favour of the 16th ult. I deſired the ſmith to make a complete Drag for a two-wheeled carriage, according to the form of thoſe in uſe in this neighbourhood: he has accordingly finiſhed it in a very workmanlike manner, and which I have ſent off by this day's waggon. The ſmith informs me, that enlarging the wheel, or increaſing the length of the ſhoulders, gives the Drag great advantages, by making it leſs liable to be choaked with mud, and by giving it a facility to adapt itſelf to hills of little or conſiderable ſteepneſs, which it does readily, by placing itſelf leſs or more forward. It does not appear that any great weight is applied to the wheel; and for that reaſon, wheels made of caſt-iron, with ſpokes, will anſwer equally well, are lighter, and leſs expenſive.

The wheel is only ſeven inches diameter, and the ſhoulders in this Drag are much longer than thoſe in the wooden model, for the reaſons before given. I hope it will be ſufficiently wide to receive the London wheels, which ſhould lie eaſy, without preſſing againſt its upright ſides. By frequent uſe, the part on which the greateſt preſſure is applied, will be worn away, ſo as to injure the machine; but in order to prevent that, it is neceſſary to ſhoe it at its firſt onſet, by fixing on a plate of iron (ſteel I ſhould imagine better) by means of two holes in its bottom, which will always receive a ſimilar piece, when it may be wanted, ſo that the Drag is eaſily kept in good repair.

It is probable, that many improvements may be made in this machine, eſpecially in the ſize and conſtruction of its wheel. Suſpecting that your wheels may be wider than ours, I have had this Drag made wider in its inſtep, its neck longer and ſtouter, and in conſequence its body of a greater length, which, with the chain and additional ſhoe, make it weigh eighty pounds, being twenty pounds heavier than any made here before.

I am, SIR,

Your obedient humble ſervant,

RICHARD MOYLE.

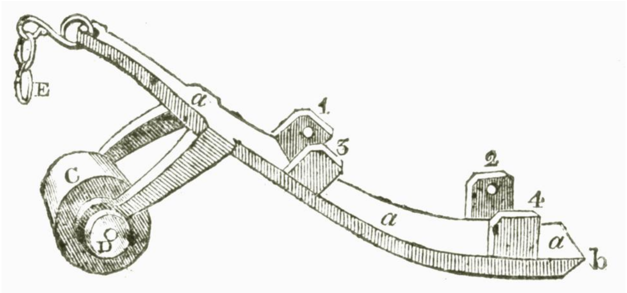
Marazion,
Feb. 2, 1795.

THIS is to certify, that we have lately made uſe of, and applied to our carts, a Wheel-drag, invented by Joſeph Kneebone, of Marazion, in Cornwall, for the effectual ſtopping of two-wheeled carriages in deſcending ſteep hills, and for taking off the increaſed weight thrown on the ſhaft-horſe's back in all deſcents.

This invention, which is ſimple and eaſily applied, anſwers the above intentions in the completeſt manner, ſo as to enable us to convey as much weight down the ſteepeſt hill as on a level, and with as much eaſe to the ſhaft-horſe.

We apply the Wheel-drag, on the brow of the hill, to the near-wheel, faſtening it to the ſhaft by a chain, to prevent the wheel from paſſing over it, in caſe of great obſtacles; and we have never obſerved that deep ruts, or looſe ſtones, in any manner leſſen the advantages which this contrivance is calculated for. Inſtead of a loaded cart running on the heels of the ſhaft-horſe on deſcending hills, this Drag, by ſupporting and elevating the wheel, places it on a level, ſo as to oblige the horſe to draw a ſmall burden; and, in ſome inſtances, it is even neceſſary to link the chain-horſe to the dragged-wheel ſide, by which means a weak horſe may be placed within the ſhafts without any riſk or danger. After the cart is deſcended to the bottom of the hill, the drag is taken off, and hung at the under part of the tail of the cart, by two hooks paſſing through the holes in the ſhoulders, 1, 2.

James Tamblyn, } Farmers
Thomas Roskilley, } and
Robert Keskeys, } Carters.



Deſcription of the Cut of Mr. JOSEPH KNEEBONE'*s* WHEEL-DRAG *for Two-wheeled Carriages.*

a. a. a. A piece of wrought iron, curved to the exact form of a cart-wheel, with the thickeſt part at *b.* on which the weight of the cart reſts.

1. 2. 3. 4. Are ſhoulders which keep the wheel within the Drag, and ſhould be about four inches high.

C. The wheel, made of ſolid iron, nearly as wide as the Drag, ſeven inches in diameter, runs on its axis at D. has a ſtrong ſhoulder, and ſtanding forward reſiſts the ſudden jolts of rough roads.

E. The chain to be faſtened to the near-ſhaft, to keep the Drag properly under the wheel, which from jerks might be apt to paſs over the Drag, and leave it behind: this is a proper precaution, though ſeldom wanted if the Drag is well conſtructed,

In the ſhoulders 1. 2. are ſhewn holes, by which the Drag is hung on hooks, at the under part of the tail of the cart, when out of uſe.